National Institute of Environmental Health Sciences

Long-term trends in atmospheric pollen levels in the city of Thessaloniki, Greece

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Abstract:

We examined the long-term trends in pollen atmospheric levels in Thessaloniki, the second largest city of Greece. On the basis of data collected during the period 1987-2005, we estimated trends in the atmospheric pollen levels for the 16 different taxa, each of whose contribution to the total atmospheric pollen concentration was at least 0.5%. We also tested for trends towards earlier, longer or more highly peaked pollen seasons. The salient feature of these data is that the levels of pollen have been increasing; this is true for the majority of the individual taxa examined (12 out of 16) and for their aggregate. On average, the atmospheric pollen concentration is doubling every decade, but for some species the rate is much higher, with doubling times less than 5 years. Among the taxa with the highest rate of long-term trend in atmospheric pollen concentration, four belong to the group of woody plants (Cupressaceae, Quercus, Platanus, Pinaceae) and only one to that of herbs (Urticaceae). For the pollen-season-related attributes (onset, peak, end and duration), there was no systematic tendency and the changes were more nuanced. The observed increase in pollen abundance coincides with a rise in air temperature, which is the only meteorological factor to have experienced a sustained and significant change over the same period in Thessaloniki. Our results suggest that changes in pollen distributions are dominated by increases in pollen production rather than changes in flowering phenology and that several species showing strong trends might serve as bio-indicators of expected climate change. Given that the pollen-producing reservoir around the city has not increased, these results provide further evidence of the impact of climate change on plant biota.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Ecosystem Changes, Temperature

Air Pollution: Allergens, Interaction with Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Greece

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified